Request 0102

TOP/CL INVESTIGATION REPORT 32954/

FCCU PRV LOTO

File Name: 2013 1-31 PRV LOTO

Date and Time of Incident: 1/31/2013, 0917.

Investigation Start Date and Time: 3/25/2013, 0600.

Team Members: Pat Mullen (Facilitator), Joe Martin, Chris Gutierrez (Investigators).

Event Summary:

On Thursday Jan 31st, 2013 – maintenance was permitted to work on FCCU PRV4059. While preparing the job site the crew found a steam valve in the car sealed open position. The steam is used as a purge on the downstream side of the PRV and is in between the block valve and PRV. This PRV was being pulled for maintenance on 4BC25 – PRV4059/4PSV502.

Maintenance crafts identified the open steam valve within the downstream isolation valve and contacted the lead operator to address. The lead operator isolated the valve and discussed the situation with maintenance crafts. The relief valve was subsequently rescheduled and worked to completion February 13, 2013.

Problem Statement:

Expected:	Permits will only be issued after all identified sources of energy have been isolated and locked out.
Actual:	On Thursday Jan 31st, 2013 – a craftsman was permitted to pull a PRV with steam purge still lined up.
Impact:	A Near Miss was reported and there was a potential injury to craftsmen.

Physical Description:

Located at the top deck of the FCCU H2S Absorber (4BC25) are two 3x4 PRV's numbered 4058 and 4059. PRV 4059 was on a two year maintenance rotation and had been scheduled for routine service on January 31st 2013. These two relief valves share a steam system that supplies a 40 pound purge steam to the downstream side of each relief valve. Each relief valve discharge has a ¾"steam purge valve located on top of the piping detail. The purpose of the steam purge is to keep the valves seats clean in fouling service.

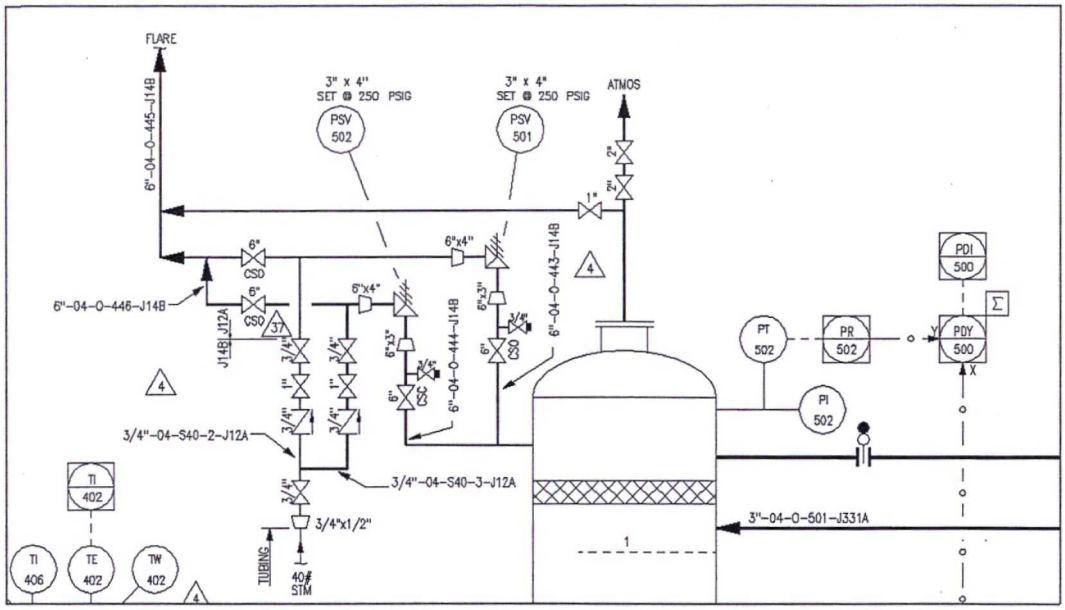

Figure 1: P&ID of PRVs

Situation Description:

The night of January 8, 2013 the FCCU outside operator was directed by the lead operator to prepare PRV 4059 for upcoming maintenance the next day. A discussion occurred wherein the outside operator was given a hand drawn diagram showing the top section of 4BC25, PRV 4059 and the associated inlet and outlet valves that were to be blocked in. No mention of the ¾" steam purge was made and the steam purge system was not noted on the process drawing or subsequent isolation documents. Lock box #9 was prepared and the isolation documents were made ready for the next day. Night shift operators noted in their respective end of shift reports that PRV 4059 was ready for maintenance. A closer look at the actual short text language during the investigation would later reveal that only the scaffold and crane support were scheduled to be worked January 9th, 2013, not PRV 4059.

The maintenance crew arrived January 9th to job walk PRV 4059. While reviewing the job site it was noted that the scaffold necessary for safe access to the relief valve was not yet in place. The work ticket went back to the planner for the scaffold to be rescheduled. The crane and scaffold showed up two more times on the schedule finally getting completed on January 22nd, 2013.

Relief valve 4059 was scheduled to be worked on dayshift January 31 2013. The night of January 30 2013 the FCCU lead operator directed the outside operator to verify the isolation of PRV 4059. The outside operator noted this verification in his end of shift report. No mention was made of the ¾" steam purge valve.

Day shift of January 31, 2013 the maintenance crew arrived to perform work on the H2S absorber PRV 4059. The FCCU lead operator directed the outside operator to verify isolation of the relief valve. The outside operator climbed 4BC25, verified PRV4059 inlet and outlet lines were blocked and informed the

LOO. The LOO prepared a hot work permit to include the crane and relief valve maintenance. Crafts acknowledged the permit, signed the list indicating the relief valve inlet and outlet valves were isolated, then applied their locks to lock box #9. A short while later a job walk was conducted that included the lead operator, maintenance craft persons, and operations maintenance specialist. A discussion of the job ensued near the base of 4BC25 and the maintenance crew was released to work the job.

Maintenance ascended the tower and accessed the scaffold in order to prepare the job site for removal of the relief valve. Upon review of the isolation conditions maintenance personnel noticed a ¾" steam purge valve on top of the relief valve discharge detail was car sealed in the open position. Maintenance stopped their activities and notified the lead operator.

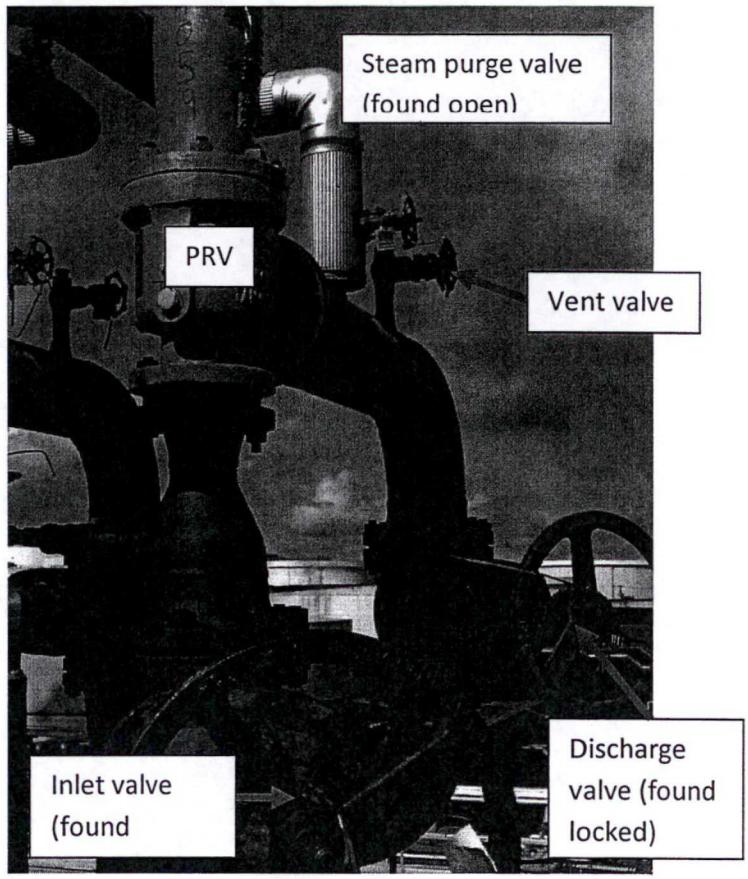

Figure 2: Photo of PRV

Investigation Conclusions:

Whilst joint job walks are required per permit to work, the actual performance language in the instruction lends ambiguity to the process. It is not widely inferred that a physical hands on identification of isolation points is required for perceived high frequency/low risk work such as relief valves.

The isolation of relief valves is considered a basic, relatively easy task. Thus it is a good task to delegate to subordinates or those that need to gain field experience. This allows the lead operator to maximize effectiveness in the day to day operations. Comparably, very few relief valves have steam purges so an inexperienced person could overlook the third valve on a relief valve detail that routinely has only two.

Prior to 2013, control of hazardous energy standing instruction included direction for relief valve isolation and by reference, to the documentation requirements within even though relief valves were considered exempt from the instruction. The current form of the standing instruction specifically excludes relief valves from its scope and has omitted all preparatory language in reference to relief valves. Instead, the relevant document section refers a person to PSIE020 with the wordy title "H2S or Other Toxic Gas Precautions During Removal of PRV's from Live Lines & Opening Live Flare." As far as the investigators are concerned, once a line is blocked it no longer qualifies as a live line and opening to live flare is indeed rare so the effectiveness of this instruction is immediately called into question with

just the title alone. Nonetheless, the instruction is void of any documentation requirements instead referring the user back to the control of hazardous energy instruction.

Recommendations:

Identify relief valves in the plant that have steam purges on them by updating the HSSE Barrier PRV monthly Check-Offs and;

- Update programs/paperwork to include steam purges.
  - Pressure Relief Valve database IDMS. (Matthew LeCren to be assigned)
  - HSSE Barrier Check-Offs as previously indicated. (Shift Team Leaders to be assigned)
- Uniquely identify PRV's with purge steam in the field with signage. (Operators on each unit to be assigned)
  - Attach identification tags to car sealed purge steam block valves closest to the PRV. (Operators on each unit to complete during monthly PRV Barrier Checks)
- Prepare a PowerPoint refresher presentation regarding joint job walk expectations as they relate to current PSIA008 (Permit to Work) and link this information to the Newsletter. (Chris Gutierrez to be assigned)
- Create a Newsletter regarding this incident as a learning tool to be distributed plant wide. (Joe Martin to be assigned)

Clarify Standing Instruction A008 around expectations regarding joint job walks to include a detailed review of the physical job site by all affected parties.

- Current Permit to Work Standing Instruction has been changed as of 3/14/13 indicating the following:
  - "A detailed review of the physical jobsite by the permit issuer and permit receiver in order to come to a clear understanding of work scope, equipment conditions, and job site conditions." (Tommy Braaten will be assigned this item to explore further clarification if needed, i.e. the definition of "physical" in terms of proximity or distance from the actual task/job being completed.)

LATERAL FINDINGS AND RECOMMENDATIONS BELOW:

Revise existing or create new standing instruction that details expectations regarding isolation of pressure relief valves. Clarify; (Dan Peek to be assigned)

- Documentation requirements.
- LOTO requirements' pertaining to PRV's; i.e. are they or should they remain exempt and should we be completing isolation packages?
- Clarify Blind Flange requirements.

- Clearly identify how and when crafts are to be utilized to confirm PRV isolations in fresh air type service.

Explore engineering steam purges outside of the PRV isolation block valves in future applications. (Matthew LeCren to be assigned)

- Document reasons for steam purges in IDMS so that operations can access a better understanding of process related to PRV's.

Explore training aspects of equipment isolation tasks and clarify:

- Include steam purge information in PRV Hazards section of Computer Based Training. (Pat will follow up on who owns the CBT's)
- The extent to which newly hired operators are trained to look at equipment isolations in an inquisitive and curious manner so as to identify problems and risks within the isolated equipment. (Janita will be assigned)
- Explore suggestions for what equipment isolation scenarios Lead Outside Operators should use as a training tool in order to increase new operators knowledge and confidence. (Janita will be assigned)
- Define what the expectation of newly hired Outside Operators if for knowing how to isolate equipment. (Janita will be assigned)